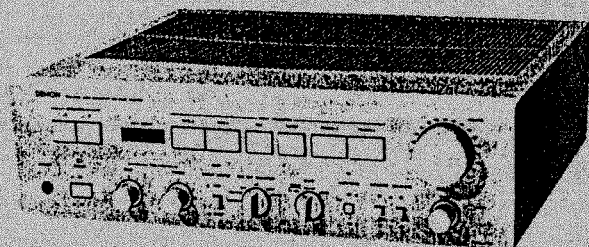


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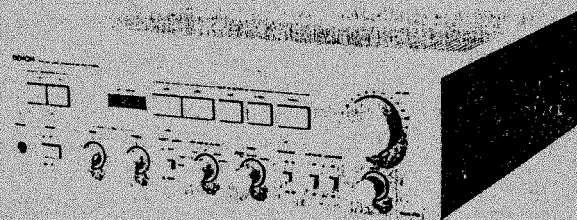
Hi-Fi Pre-Main Amplifier

SERVICE MANUAL MODEL PMA-770/750

SOLID STATE
PRE MAIN AMPLIFIER



PMA-770



PMA-750

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NIPPON COLUMBIA CO., LTD.

SPECIFICATIONS

• PMA-770

POWER AMPLIFIER SECTION

Circuit Type:	All stage direct DC servo circuit
Rated Output Power:	Both channel drive 20 Hz to 20 kHz 100 W + 100 W (DIN, U.K., EUROPE, U.S.A.) (8 ohm Load) 1 kHz (4 ohm Load) 150 W + 150 W (DIN, U.K., U.S.A.) 1 kHz (4 ohm Load) 50 W + 50 W (IEC) (Subject to change by temperature test)
Total Harmonic Distortion:	0.008% (20 Hz — 20 kHz at —3 dB rated output 8 ohm Load) 0.02% (20 Hz — 20 kHz at rated output 8 ohm Load) (U.S.A.)
Intermodulation Distortion:	Below 7 kHz / 60 Hz : 1/4 0.002% (at amplitude output equivalent to rated output)
Output Band Width:	5 Hz — 100 kHz (IHF THD 0.035%)
Transmission Characteristics:	1 Hz — 250 kHz +0 dB -3 dB (at 1 W output)
Input Sensitivity:	150 mV
Input Impedance:	47 k ohm
Output Impedance:	0.08 ohm (1 kHz)
Output Terminals:	Speaker: A and B Load 4 — 16 ohm A + B Load 8 — 16 ohm Headphone/Stereo headphone

EQUALIZER AMPLIFIER SECTION

Equalizer Amplifier Output:	Maximum Output: 10 V (at 47 k ohm Load) Rated Output: 150 mV Total harmonic wave distortion: below 0.002% (at 1 kHz, 8 V output)
Input Sensitivity/Input Impedance:	PHONO-1, 2 MM 2.5 mV 47 k ohm MC 125 μ V 100 ohm TUNER 150 mV 47 k ohm AUX, TAPE 150 mV 47 k ohm
RIAA Deviation:	PHONO-1, 2 MM within ± 0.2 dB (20 Hz — 100 kHz) MC within ± 0.2 dB (20 Hz — 100 kHz)

OVERALL CHARACTERISTICS

SN Ratio (IHFA Network):	PHONO-1, 2 MM 90 dB (input terminals short-circuited for 2.5 mV input) MC 73 dB (input terminals short-circuited for 250 μ V input)
Tone Control Adjustable Range:	TUNER, TAPE, AUX: 110 dB (input terminals short-circuited) BASS 100 Hz ± 8 dB TREBLE 10 kHz ± 8 dB
Filtering Characteristics:	SUBSONIC 18 Hz, 6 dB/oct
Loudness Characteristics:	Low frequency 100 Hz + 7 dB High frequency 10 kHz + 6 dB

AC OUTLET:

(For U.S.A. and Canada)

POWER SOURCE:

POWER CONSUMPTION:

DIMENSIONS:

WEIGHT:

SWITCHED x 2, 100 W (Total)
UNSWITCHED x 1, 250 W
Germany and France AC 220 V, 50 Hz; U.K. AC 240 V, 50 Hz;
U.S.A. AC 120 V, 60 Hz; Hong Kong AC 200V, 50 Hz
270 W (U.S.A.); 400 W (IEC); 290 W (Hong Kong);
800 W Maximum Output
434 mm (W) x 132 mm (H) x 407 mm (D)
(including rubber feet, control knobs, and terminals)
12 kg

Design and specifications are subject to change without prior notice.

NOTE: The following code correspond to the appropriate models.

E2 for Europe EF for France, EK for U.K., E3 for U.S.A., E3 for Canada and E1 for Hong Kong, Singapore.

This Service Manual is prepared based on PMA-770 E2.

SPECIFICATIONS

• PMA-750

POWER AMPLIFIER SECTION

Circuit Type:	All stage direct DC servo circuit
Rated Output Power:	Both channel drive 20 Hz to 20 kHz 80 W + 80 W (DIN, U.K., EUROPE, U.S.A.) (8 ohm Load) 1 kHz (4 ohm Load) 100 W + 100 W (DIN, U.K., U.S.A.) 1 kHz (4 ohm Load) 50 W + 50 W (IEC) (Subject to change by temperature test)
Total Harmonic Distortion:	0.008% (20 Hz — 20 kHz at —3 dB rated output 8 ohm Load) 0.02% (20 Hz — 20 kHz at rated output 8 ohm Load) (U.S.A.)
Intermodulation Distortion:	Below 7 kHz / 60 Hz : 1/4 0.002% (at amplitude output equivalent to rated output)
Output Band Width:	5 Hz — 100 kHz (IHF THD 0.035%)
Transmission Characteristics:	1 Hz — 250 kHz +0 dB -3 dB (at 1 W output)
Input Sensitivity:	150 mV
Input Impedance:	47 k ohm
Output Impedance:	0.08 ohm (1 kHz)
Output Terminals:	Speaker: A and B Load 4 — 16 ohm A + B Load 8 — 16 ohm Headphone/Stereo headphone

EQUALIZER AMPLIFIER SECTION

Equalizer Amplifier Output:	Maximum Output: 10 V (at 47 k ohm Load) Rated Output: 150 mV Total harmonic wave distortion: below 0.002% (at 1 kHz, 8 V output)
Input Sensitivity/Input Impedance:	PHONO MM 2.5 mV 47 k ohm MC 125 μ V 100 ohm TUNER 150 mV 47 k ohm AUX, TAPE 150 mV 47 k ohm
RIAA Deviation:	PHONO MM within ± 0.2 dB (20 Hz — 100 kHz) MC within ± 0.2 dB (20 Hz — 100 kHz)

OVERALL CHARACTERISTICS

SN Ratio (IHFA Network):	PHONO MM 88 dB (input terminals short-circuited for 2.5 mV input) MC 72 dB (input terminals short-circuited for 250 μ V input)
Tone Control Adjustable Range:	TUNER, TAPE, AUX: 110 dB (input terminals short-circuited) BASS 100 Hz ± 8 dB TREBLE 10 kHz ± 8 dB
Filtering Characteristics:	SUBSONIC 18 Hz, 6 dB/oct
Loudness Characteristics:	Low frequency 100 Hz + 7 dB High frequency 10 kHz + 6 dB

AC OUTLET:

(For U.S.A. and Canada)

POWER SOURCE:

POWER CONSUMPTION:

DIMENSIONS:

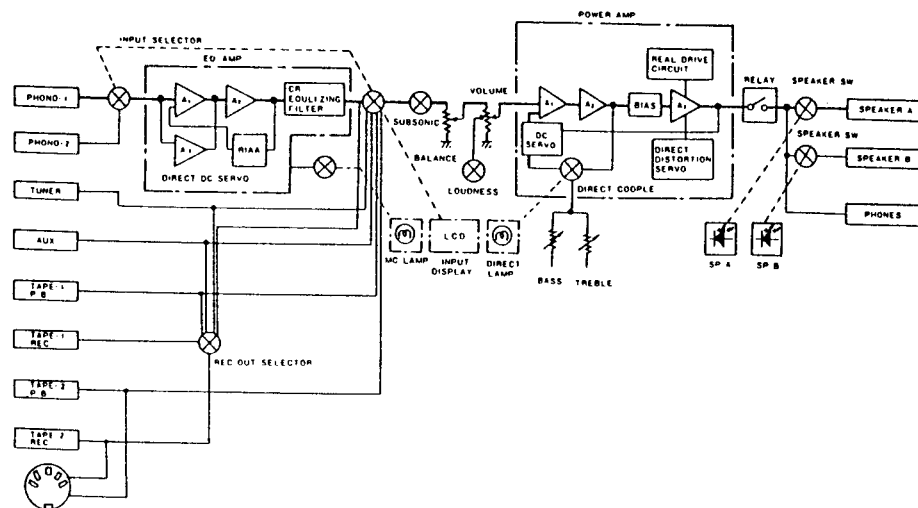
WEIGHT:

SWITCHED x 2, 100 W (Total)
UNSWITCHED x 1, 250 W
Germany and France AC 220 V, 50 Hz; U.K. AC 240 V, 50 Hz;
U.S.A. AC 120 V, 60 Hz; Hong Kong AC 200V, 50 Hz
230 W (U.S.A.); 400 W (IEC); 200 W (Hong Kong);
680 W Maximum Output
434 mm (W) x 132 mm (H) x 407 mm (D)
(including rubber feet, control knobs, and terminals)
12 kg

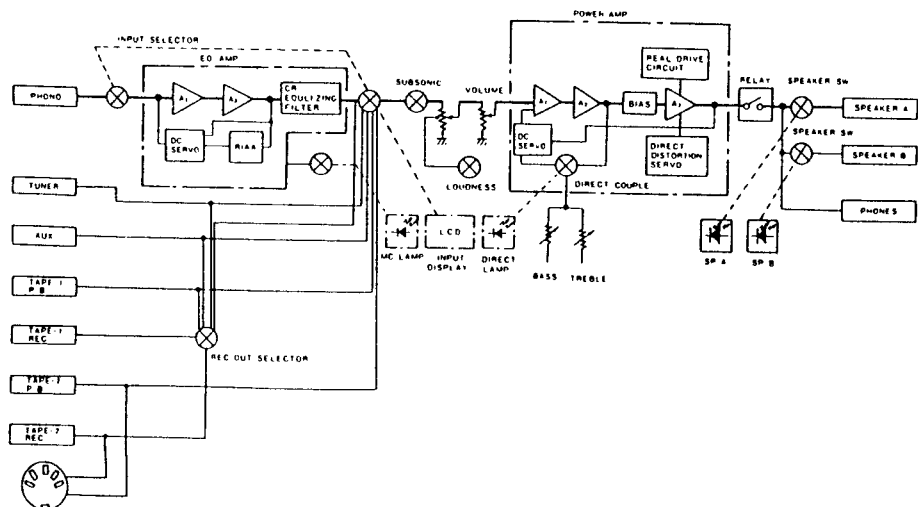
Design and specifications are subject to change without prior notice.

BLOCK DIAGRAM

• PMA-770

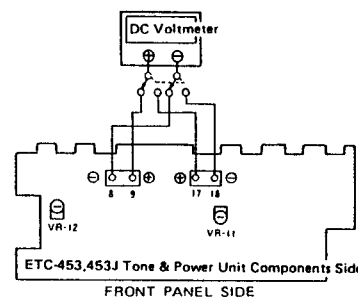


• PMA-750



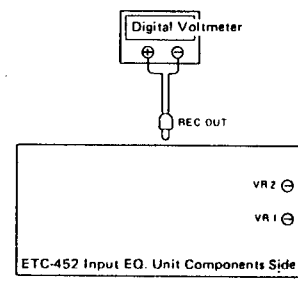
METHOD OF ADJUSTMENT

Schematic View of Tone Power for ETC-453 (PMA-770), ETC-453J (PMA-750)

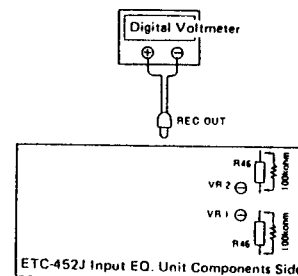


Schematic View for Input and Equalizer for ETC-452 (PMA-770), ETC-452J (PMA-750)

PMA-770



PMA-750



Adjustment of Idling Current (ETC-453, ETC-453J)

Preparation

1. Keep the unit away from direct wind blown by an air-conditioner and an electric fan. Keep the unit under normal conditions. Adjust the range of ambient temperature to 15 - 30°C.
2. Set the following switches as follows:
 - POWER (power switch) to off
 - VOLUME (volume control) to ∞ (min.)
 - DIRECT COUPLE (direct switch) to DIRECT
 - SPEAKER (speaker terminal) to no load (a speaker and a dummy resistor are not connected)

Adjustment

1. Remove the top cover and turn the variable resistors VR11 and VR12 of ETC-453 and ETC-453J (tone and power unit) in the clockwise direction until they stop. Connect a DC voltmeter between the negative terminal 9 and the positive terminal 8, and between the positive terminal 17 and the negative terminal 18.
2. Connect the power source cord to an AC outlet. Turn on the power switch. Turn the variable resistors VR11 and VR12 in the counterclockwise direction within one minute. Preset adjust the voltages at the respective test points as follows:
 - PMA-770 15 ± 2 mV
 - PMA-750 11 ± 2 mV
3. Set the variable resistors VR11 and VR12 to 3 minutes after the presetting as follows:
 - PMA-770 19 ± 1 mV
 - PMA-750 13 ± 1 mV

Adjustment of ETC-452 and ETC-452J

Preparation

1. Insert the short pin into the "phono" input terminal.
2. Connect a digital voltmeter between the "REC" output terminals (LCH and RCH). the output voltage at the digital voltmeter must be 0.01 - 1 mV (DC).
3. Connect a resistor of 100 k ohms (1/4 W) between the resistors R45 and R46 of 10 M ohms of the unit in order to make measurement easy (only for PMA-750).
4. Set the RECOUT SELECTOR to the "phono" position and set the volume control to ∞ (min.).

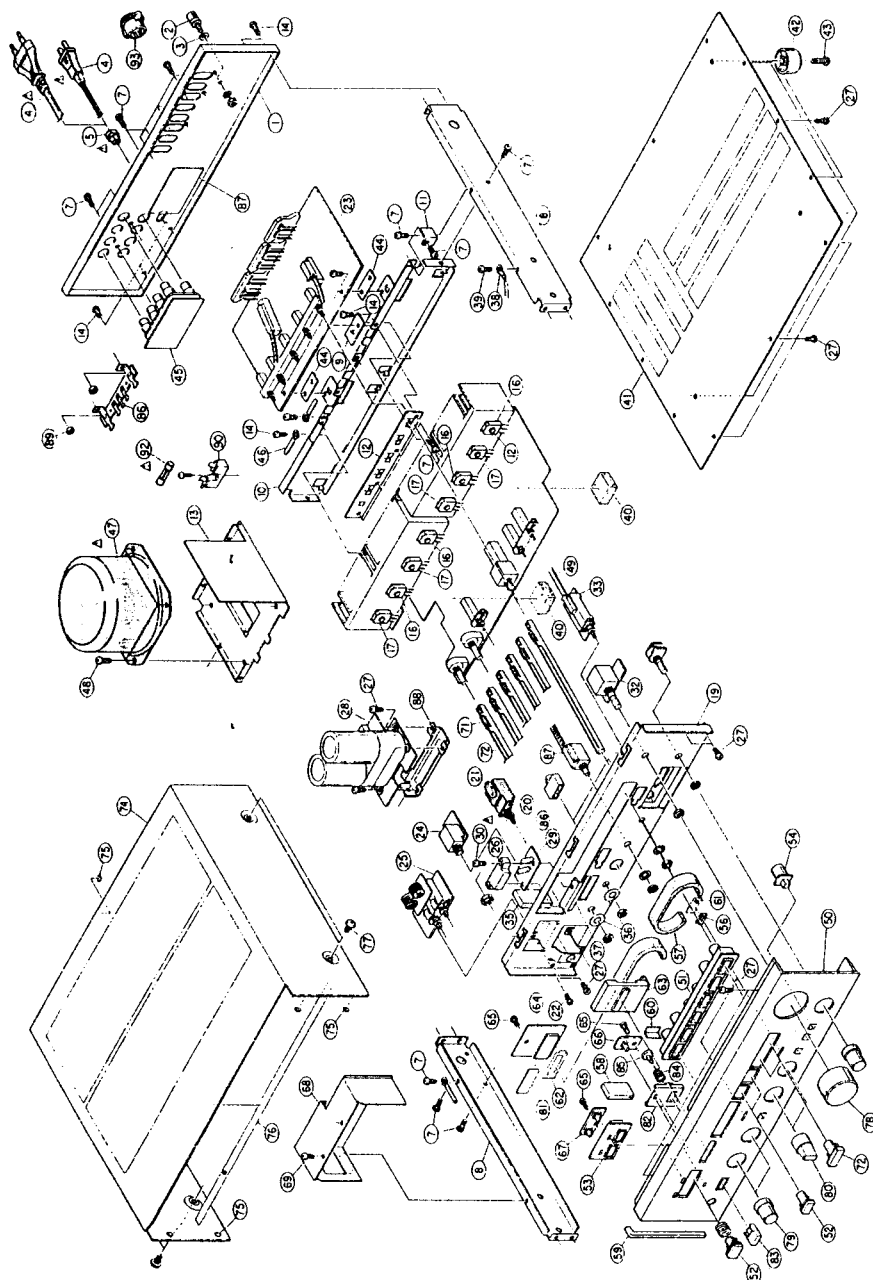
Adjustment

1. Turn on the power switch. After two minutes, perform the following procedures.
 - PMA-770, PMA-750
 - Adjust the variable resistor 1 (semi-fixed resistor of 100 k ohms) so that the output for LCH at the digital voltmeter reads less than 0.5 V (DC).
 - Adjust the variable resistor 2 (semi-fixed resistor of 100 k ohms) so that the output for RCH at the digital voltmeter reads less than 0.5 V (DC).

EXPLODED VIEW OF CHASSIS AND CABINET

△ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.

This EXPLODED VIEW is prepared based on PMA-770E2.



EXPLODED VIEW OF PARTS LIST

• (PMA-770)

Note: 1. See addendum list below for the parts with asterisk (*) on the Ref. No. and the other parts not included in this list.
2. The list is prepared based on E2.
3. • Mark same as PMA-750E2.

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
1	1050460000	BACK PANEL	52	1130291102	PUSH KNOB (SP)
2	2050071016	TERMINAL ASS'Y	53	1460432107	PANEL BUSH (SP)
3	4770018001	WASHER	54	1130306000	PANEL KNOB (LOUDNESS) ASS'Y
4	2062002031	AC CORD	55		
5	4450020005	CORD BUSH	56	1430224002	LENS
6	4730354035	TAPPING SCREW (2)3x8 MFN1B	57	4610155011	BLIND
7	4120733224	SIDE CHASSIS	58	4610155024	BLIND
8	4410355008	HOLD PLATE	59	4610155040	BLIND
9	4110320113	MAIN CHASSIS	60	1250015006	BLIND SHEET (B)
10	4120965018	SUPPORT BRACKET	61	1430240002	FILTER
11	4410353000	SHEET	62	1430230009	WINDOW PLATE
12	4110333003	TRANS CHASSIS ASS'Y	63	1430228008	WINDOW
13	4770064107	FIXING SCREW	64	ETC-045483	LCD UNIT
14	4170153100	POWER RADIATOR	65	4770096007	PUSH RIVET
15	2710150028	TRANSISTOR 2SA1146(R)/(O)	66	ETC-045485	POWER LED UNIT
16	2730298023	TRANSISTOR 2SC2706(R)/(O)	67	ETC-045484	SPEAKER LED UNIT
17	4700012022	CROSS PAN SCREW WITH W.S.W 3x12	68	4120988008	LAMP COVER
18			69	4470052009	FIX. SCREW
19	4110321206	FRONT CHASSIS	70	4120962008	CONNECTING BRACKET
20	2124263022	PUSH SWITCH	71	4630274066	SPRING
21	2538003014	CERAMIC CAP 0.0047μF/50V	72	1130290103	PUSH KNOB (INPUT)
22	4700009006	CROSS PAN SCREW WITH S. 3x6	73	1130291102	PUSH KNOB (SP)
23	ETC-045281	INPUT & EQ. UNIT	74	1020128000	TOP COVER
24	ETC-045282	HEADPHONE JACK UNIT	75	1040034006	STOPPER
25	ETC-045283	SPEAKER SWITCH UNIT	76	1220069008	SPACER
26	1430229007	L.C.D. LENS	77	4734801005	TAPPING SCREW (TRUS) 4x8
27	4730354019	TAPPING SCREW (2)3x8	78	1120265203	KNOB
28	ETC-045481	RECT & LCD UNIT	79	1120359106	KNOB (A)
29	ETC-045482	LAMP UNIT	80	1120360001	KNOB (B)
30	4730358015	TAPPING SCREW (2)3x14	81	1430354019	COLOR PLATE
31	ETC-04531	TOPE & POWER UNIT	82	1460430109	PANEL BUSH (POWER)
32	ETC-04532	VOLUME UNIT	83	1130171222	PUSH KNOB ASS'Y
33	ETC-04533	CARTRIDGE SW UNIT	84	4630220007	SPRING
34	2120197008	ROTARY REMOTE	85	1190041002	STOPPER
35	4610155037	BLIND	86	2050089008	7P W TERMINAL
36	1250014007	BLIND SHEET (A)	87	4150088004	INSULATING SHEET
37	4150208004	INSULATING SHEET	88	4700042005	CROSS PAN SCREW WITH S. WASHER 3x8 (BLACK)
38	2030176106	WIRE ASS'Y	89	4756008008	NUT #3
39	4700044005	TAPPING SCREW WITH W. 3x8	90	2020013004	FUSE HOLDER
40	4610157080	CUSHION	91	5130158195	FUSE LABEL
41	1050450007	BOTTOM COVER	92	2061015087	FUSE (4A)
42	1048001002	FOOT	93	2030804009	5P CONNECTOR (DIN)
43	4730355018	TAPPING SCREW (2)3x10	94	2412156003	CARBON FILM RESISTOR 470 k ohm
44	4150197005	INSULATING SHEET	95	4630274024	SPRING
45	ETC-045284	SPEAKER TERMINAL UNIT	PACKING & ACCESSORIES (not included EXPLODED VIEW)		
46	EP-6214	CORD HOLDER	a	5040064001	CABINET SHEET
47	2335241202	POWER TRANS.	b	5030301101	CUSHION
48	4730454032	TAPPING SCREW (2)4x8 (BLACK)	c	5010755049	CARTON CASE
49	4350052018	FLEXIBLE SLIDER	d	5110994001	INST. MANUAL
50	1440912003	FRONT PANEL			
51	1460433106	PANEL BUSH (INPUT)			

ADDENDUM LIST

Ref. No.	Part Name & Descriptions	E1 for Hong Kong	EK for U.K.	Part No.	E3 for U.S.A.
1	BACK PANEL	1050462008			
4	AC CORD	2006031026			
5	CORD BUSH	MD-3802			
6	AC OUTLETS	2033909008			
20	PUSH SWITCH	2124263022			
21	CAPACITOR	2538003014			
23	INPUT & EQ. UNIT	ETC-0452D1			
24	HEADPHONE JACK UNIT	ETC-0452D2			
25	SPEAKER SWITCH UNIT	ETC-0452D3			
45	SPEAKER TERMINAL UNIT	ETC-0452D4			
47	POWER TRANS.	2335304107			
96	VOLTAGE SEL. SWITCH	2120186006			
97	CROSS PAN SCREW 3x6 (BLACK)	4711303034			
PACKING & ACCESSORIES (not included EXPLODED VIEW)					
c	CARTON CASE	5010755049			

EXPLODED VIEW OF PARTS LIST

(PMA-750)

- Note: 1. See addendum list below for the parts with asterisk (*) on the Ref. No. and the other parts not included in this list.
 2. The list is prepared based on E2.
 3. * Mark same as PMA-770E2.

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
1	1050459008	BACK PANEL	52	1130291102	PUSH KNOB (SP)
2	2050071016	TERMINAL ASS'Y	53	1460432107	PANEL BUSH (SP)
3	4770018001	WASHER	54	1130306000	PUSH KNOB (LOUDNESS) ASS'Y
4	2062002031	AC CORD	55	—	—
5	4450020005	CORD BUSH	56	—	—
6	—	—	57	4610155011	BLIND
7	4730354035	TAPPING SCREW (213x8 MFN1B)	58	4610155024	BLIND
8	4120732308	SIDE CHASSIS	59	4610155040	BLIND
9	4410355008	HOLD PLATE	60	—	—
10	4110320100	MAIN CHASSIS	61	—	—
11	4120965005	SUPPORT BRACKET	62	1430230009	WINDOW PLATE
12	4410353000	SHEET	63	1430228008	WINDOW
13	4110334002	TRANS CHASSIS ASS'Y	64	ETC-0454K3	LCD UNIT
14	4770064107	FIXING SCREW	65	4770096007	PUSH RIVET
15	4170156000	POWER RADIATOR	66	ETC-0454K5	POWER LED UNIT
16	2710143022	TRANSISTOR 2SA1187(O)/(Y)	67	ETC-0454K4	SPEAKER LED UNIT
17	2730243025	TRANSISTOR 2SC2838(O)/(Y)	68	ETC-0454K6	LED UNIT
18	4700012022	CROSS PAN SCREW WITH W.S.W. 3x12	69	ETC-0454K7	LED UNIT
19	4110321206	FRONT CHASSIS	70	4120962008	CONNECTING BRACKET
20	2124263022	PUSH SWITCH	71	4630274066	SPRING
21	2538003014	CERAMIC CAP. 0.0047uF 450 W	72	1130290103	PUSH KNOB (INPUT)
22	4700009006	CROSS PAN SCREW WITH S. WASHER 3x6	73	1130291102	PUSH KNOB (SP)
23	ETC-0452K1	INPUT & EQ. UNIT	74	1020128000	TOP COVER
24	ETC-0452K2	HEADPHONE JACK UNIT	75	1040034006	STOPPER
25	ETC-0452K3	SPEAKER SWITCH UNIT	76	1220069008	SPACER
26	1430229010	L.C.D. LENS	77	4734801005	TAPPING SCREW (TRUS) 4x8
27	4730354019	TAPPING SCREW (213x8	78	1120265203	KNOB
28	ETC-0454K1	RECT & LCD UNIT	79	1120359106	KNOB (A)
29	ETC-0454K2	LAMP UNIT	80	1120374000	KNOB (C)
30	4730358015	TAPPING SCREW (213x14	81	1430354019	COLOR PLATE
31	ETC-0453J1	tone & POWER UNIT	82	1460430109	PANEL BUSH (POWER)
32	ETC-0453J2	VOLUME UNIT	83	1130171222	PUSH KNOB ASS'Y
33	ETC-0453J3	CARTRIDGE SW UNIT	84	4630220007	SPRING
34	2120197008	ROTARY REMOTE	85	1190014002	STOPPER
35	—	—	86	2050089008	7P W TERMINAL
36	1250014007	BLIND SHEET (A)	87	4150088004	INSULATING SHEET
37	4150208004	INSULATING SHEET	88	4700042005	CROSS PAN SCREW WITH S. WASHER 3x8 (BLACK)
38	2030176106	WIRE ASS'Y	89	4756008008	NUT #3
39	4700044005	TAPPING SCREW WITH W 3x8	90	2020013004	FUSE HOLDER
40	4610157080	CUSHION	91	5130159185	FUSE LABEL
41	1050450007	BOTTOM COVER	92	2061015087	FUSE (4A)
42	1048001002	FOOT	93	2038084009	5P CONNECTOR (DIN)
43	4730355018	TAPPING SCREW (213x10	94	2412156003	CARBON FILM RESISTOR 470 k ohm
44	4150197005	INSULATING SHEET			SPRING
45	ETC-0452K4	SPEAKER TERMINAL UNIT			
46	EP 6214	CORD HOLDER			
47	2335344002	POWER TRANS			
48	4730454032	TAPPING SCREW (214x18 (BLACK)			
49	4350052018	FLEXIBLE SLIDER			
50	1440928000	FRONT PANEL			
51	1460455003	PANEL BUSH (INPUT)			

PACKING ACCESSORIES

a	5040064001	CABINET SHEET
b	5030301101	CUSHION
c	5010755036	CARTON CASE
d	5110994001	INST. MANUAL

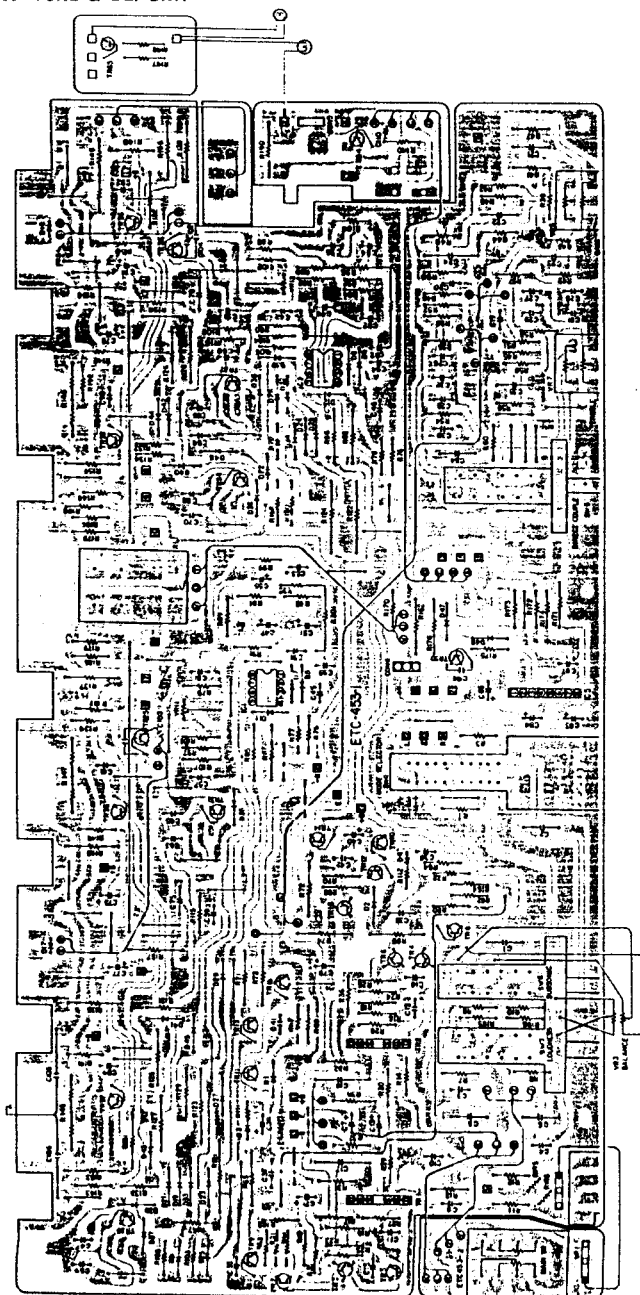
ADDENDUM LIST

Ref. No.	Part Name & Descriptions	E1 for Hong Kong	EK for U.K.	E3 for U.S.A.
1	BACK PANEL	1050459008	1050461009	
4	AC CORD	2062002000	2006031026	
5	CORD BUSH	MD-2982H	MD-3802	
6	AC OUTLET	—	2033909008	
20	PUSH SWITCH	2124263022	2124263022	
21	CAPACITOR	2538003014	2538003014	
23	INPUT & EQ. UNIT	ETC-0452K1	ETC-0452M1	
24	HEADPHONE JACK UNIT	ETC-0452K2	ETC-0452M2	
25	SPEAKER SWITCH UNIT	ETC-0452K3	ETC-0452M3	
28	RECT & LCD UNIT	ETC-0454K1	ETC-0454M1	
29	LAMP UNIT	ETC-0454K2	ETC-0454M2	
45	SPEAKER TERMINAL UNIT	ETC-0452K4	ETC-0452M4	
47	POWER TRANS	2335345001	2335343003	
48	TAPPING SCREW	4700031016	4730454032	
64	LCD UNIT	ETC-0454K3	ETC-0454M3	
66	POWER LED UNIT	ETC-0454K5	ETC-0454M5	
67	SPEAKER LED UNIT	ETC-0454K4	ETC-0454M4	
68	LED UNIT	ETC-0454K6	ETC-0454M6	
69	LED UNIT	ETC-0454K7	ETC-0454M7	
98	VOLTAGE SEL. SWITCH	—	2120186008	
97	CROSS PAN SCREW 3x6 (BLACK)	—	4711303034	
98	WATTAGE LABEL	5130683004	—	
99	VOLTAGE LABEL	5130362008	—	
100	BLIND SHEET	5130348006	—	
101	WIRE ASS'Y	2030176151	—	
102	EARTH LABEL	5130140000	—	
103	TOOTH WASHER #3	4753001051	—	
104	CAUTION CARD	5130364006	—	
105	TOOTH WASHER #4	4753100004	—	
PACKING & ACCESSORIES (not included EXPLODED VIEW)				
c	CARTON CASE	5010755036	5010755036	
e	IMPORTANT LABEL	5130372001	—	
f	GUARANTEE CARD	5150230000	—	

PRINTED WIRING BOARD PATTERNS AND PARTS LIST

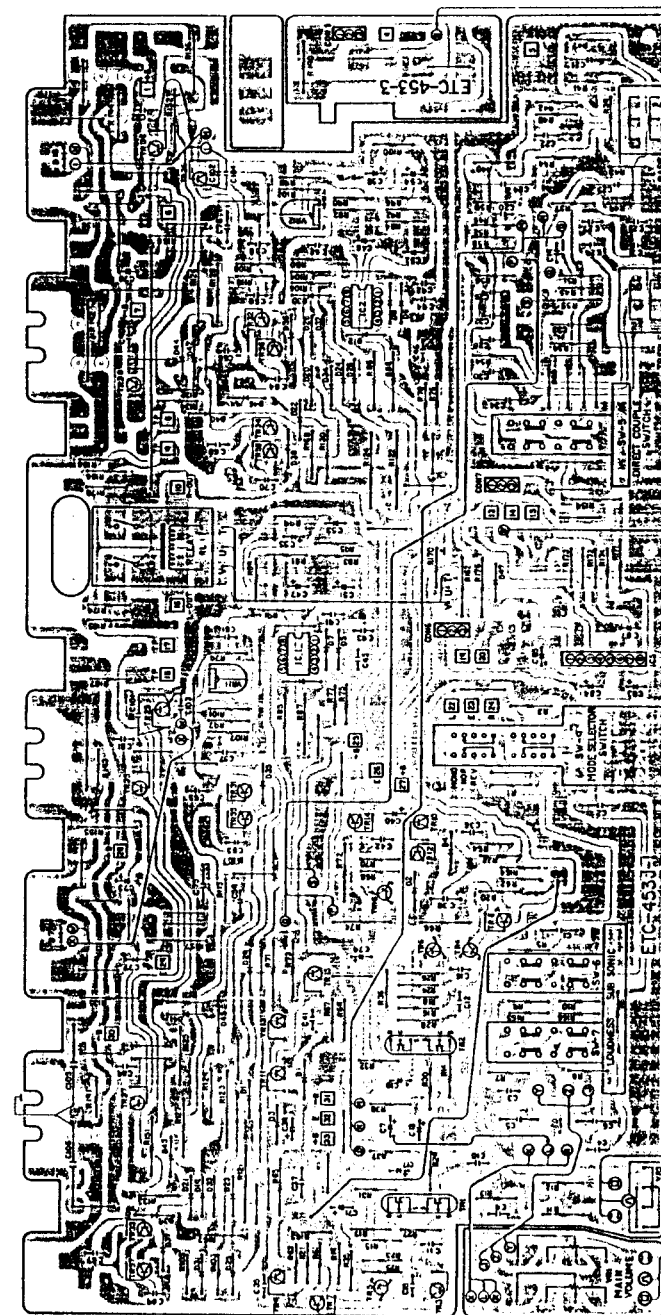
• For PMA-770

ETC-453 TONE & EQ. UNIT



• For PMA-750

ETC-453J TONE & EQ. UNIT



ETC-453 & ETC-453J TONE & EQ. UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS		
IC001	2630118001	NJM4560D INTEGRATED CIRCUIT
IC002	2630118001	NJM4560D INTEGRATED CIRCUIT
IC005	2630102004	HAI2002 INTEGRATED CIRCUIT
TR001	2750024033	μPA68H(L)/(H) FIELD EFFECT TRANSISTOR
TR002	2750024033	μPA68H(L)/(H) FIELD EFFECT TRANSISTOR
TR003	2730235020	2SC1841(F)/(E) TRANSISTOR
TR004	2730235020	2SC1841(F)/(E) TRANSISTOR
TR005	2730235020	2SC1841(F)/(E) TRANSISTOR
TR006	2730235020	2SC1841(F)/(E) TRANSISTOR
TR007	2710110000	2SA916(L) TRANSISTOR
TR008	2710110000	2SA916(L) TRANSISTOR
TR009	2710110000	2SA916(L) TRANSISTOR
TR010	2710110000	2SA916(L) TRANSISTOR
TR011	2730205005	2SC1941(L) TRANSISTOR
TR012	2730205005	2SC1941(L) TRANSISTOR
TR013	2740060007	2SD067A(C) TRANSISTOR
TR014	2740060007	2SD067A(C) TRANSISTOR
TR015	2720053005	2SB647A(C) TRANSISTOR
TR016	2720053005	2SB647A(C) TRANSISTOR
TR025	2730193015	2SC1815(BL) TRANSISTOR
TR026	2730193015	2SC1815(BL) TRANSISTOR
TR031	2730111063	2SC1213(D)/(C) TRANSISTOR
TR032	2730111063	2SC1213(D)/(C) TRANSISTOR
TR033	2710040073	2SA673A(D)/(C) TRANSISTOR
TR034	2710040073	2SA673A(D)/(C) TRANSISTOR
TR035	2730199027	2SC2238(Y)/(O) TRANSISTOR
TR036	2730199027	2SC2238(Y)/(O) TRANSISTOR
TR037	2710104029	2SA968(Y)/(O) TRANSISTOR
TR038	2710104029	2SA968(Y)/(O) TRANSISTOR
TR050	2730198044	2SC1815(Y)/(GR) TRANSISTOR
TR054	2710102005	2SA1015(Y) TRANSISTOR
TR065	2730177007	2SC1626(Y) TRANSISTOR
DO01	2760171028	HV-23G(YW) DIODE
DO02	2760171028	HV-23G(YW) DIODE
DO03	2760216019	K8-285 DIODE
DO04	2760216019	K8-285 DIODE
DO05	2760049008	1S2076 DIODE
DO06	2760049008	1S2076 DIODE
DO07	2760049008	1S2076 DIODE
DO08	2760049008	1S2076 DIODE
DO11	2760224001	HZ-30 DIODE
DO12	2760224001	HZ-30 DIODE
DO17	2760049008	1S2076 DIODE
DO18	2760049008	1S2076 DIODE
DO19	2760049008	1S2076 DIODE
DO20	2760049008	1S2076 DIODE
DO21	2760049008	1S2076 DIODE
DO22	2760049008	1S2076 DIODE
DO23	2760049008	1S2076 DIODE
DO24	2760049008	1S2076 DIODE
DO25	2760049008	1S2076 DIODE
DO26	2760049008	1S2076 DIODE
DO27	2760049008	1S2076 DIODE
DO28	2760049008	1S2076 DIODE
DO29	2760049008	1S2076 DIODE
DO30	2760049008	1S2076 DIODE
DO31	2760049008	1S2076 DIODE
DO32	2760049008	1S2076 DIODE
DO33	2760049008	1S2076 DIODE
DO34	2760049008	1S2076 DIODE
DO35	2760049008	1S2076 DIODE
DO36	2760049008	1S2076 DIODE
DO37	2760049008	1S2076 DIODE
DO38	2760049008	1S2076 DIODE
DO39	2760221004	HZ-36 DIODE
DO40	2760221004	HZ-36 DIODE
DO41	2760049008	1S2076 DIODE
DO42	2760049008	1S2076 DIODE
DO43	2760049008	1S2076 DIODE
DO44	2760049008	1S2076 DIODE
DO45	2760221004	HZ-36 DIODE
DO46	2760221004	HZ-36 DIODE
DO47	2760049008	1S2076 DIODE
DO49	2760221004	HZ-36 DIODE

Ref. No.	Part No.	Part Name & Descriptions
RESISTORS		
(not included Carbon Film ±5%, W Type)		
VR001	2110257000	VARIABLE RESISTOR 55 k ohm MAIN
VR003	2110311001	VARIABLE RESISTOR 100 k ohm BALANCE
VR005	2110246011	VARIABLE RESISTOR 100 k ohm BASS
VR007	2110253004	VARIABLE RESISTOR 50 k ohm TREBLE
VR011	2116025058	SEMI FIXED RESISTOR 10 k ohm
VR012	2116025058	SEMI FIXED RESISTOR 10 k ohm
RO13	2412314007	100 ohm ±5% W CARBON FILM
RO14	2412314007	100 ohm ±5% W CARBON FILM
RO15	2412320017	8.2 k ohm ±2% W CARBON FILM
RO16	2412320017	8.2 k ohm ±2% W CARBON FILM
RO17	2412320017	8.2 k ohm ±2% W CARBON FILM
RO18	2412320017	8.2 k ohm ±2% W CARBON FILM
RO19	2412314010	390 ohm ±5% W CARBON FILM
RO20	2412314010	390 ohm ±5% W CARBON FILM
RO21	2412314010	390 ohm ±5% W CARBON FILM
RO22	2412314010	390 ohm ±5% W CARBON FILM
RO31	2422007003	20 M ohm ±10% W CARBON COMPOSIT
RO32	2422007003	20 M ohm ±10% W CARBON COMPOSIT
RO35	2412314036	750 ohm ±5% W CARBON COMPOSIT
RO36	2412314036	750 ohm ±5% W CARBON COMPOSIT
RO65	2440051028	6.8 k ohm ±5% W METAL OXIDE FILM
RO66	2440051028	6.8 k ohm ±5% W METAL OXIDE FILM
RO67	2412313008	100 ohm ±2% W CARBON FILM
RO68	2412313008	100 ohm ±2% W CARBON FILM
RO69	2412313008	100 ohm ±2% W CARBON FILM
RO70	2412313008	100 ohm ±2% W CARBON FILM
RO71	2440025025	47 ohm ±5% W METAL OXIDE FILM
RO72	2440025025	47 ohm ±5% W METAL OXIDE FILM
RO73	2440025025	47 ohm ±5% W METAL OXIDE FILM
RO74	2440025025	47 ohm ±5% W METAL OXIDE FILM
RO77	2412314023	470 ohm ±5% W CARBON FILM
RO78	2412314023	470 ohm ±5% W CARBON FILM
RO79	2412312003	1 k ohm ±5% W CARBON FILM
RO80	2412312003	1 k ohm ±5% W CARBON FILM
RO85	2440046020	2.7 k ohm ±5% W METAL OXIDE FILM
RO86	2440046020	2.7 k ohm ±5% W METAL OXIDE FILM
RO87	2440046020	2.7 k ohm ±5% W METAL OXIDE FILM
RO88	2440046020	2.7 k ohm ±5% W METAL OXIDE FILM
RO107	2412313053	1 k ohm ±2% W CARBON FILM
RO108	2412313053	1 k ohm ±2% W CARBON FILM
RO111	2412322015	82 ohm ±5% W CARBON FILM
RO112	2412322015	82 ohm ±5% W CARBON FILM
RO113	2412313053	1 k ohm ±2% W CARBON FILM
RO115	2412313053	1 k ohm ±2% W CARBON FILM
RO121	2440107024	5.6 k ohm ±5% W METAL OXIDE FILM
RO122	2440107024	5.6 k ohm ±5% W METAL OXIDE FILM
RO123	2440107024	5.6 k ohm ±5% W METAL OXIDE FILM
RO124	2440107024	5.6 k ohm ±5% W METAL OXIDE FILM
RO125	2440041025	1 k ohm ±5% W METAL OXIDE FILM
RO126	2440041025	1 k ohm ±5% W METAL OXIDE FILM
RO127	2440041025	1 k ohm ±5% W METAL OXIDE FILM
RO128	2440041025	1 k ohm ±5% W METAL OXIDE FILM
RO129	2410219007	27 k ohm ±5% W CARBON FILM
RO130	2410219007	27 k ohm ±5% W CARBON FILM
RO131	2412313095	120 ohm ±2% W CARBON FILM
RO132	2412313095	120 ohm ±2% W CARBON FILM
RO133	2412313095	120 ohm ±2% W CARBON FILM
RO134	2412313095	120 ohm ±2% W CARBON FILM
RO135	2440013024	4.7 ohm ±5% W METAL OXIDE FILM
RO136	2440013024	4.7 ohm ±5% W METAL OXIDE FILM
RO137	2440013024	4.7 ohm ±5% W METAL OXIDE FILM
RO138	2440013024	4.7 ohm ±5% W METAL OXIDE FILM
RO139	2412315035	33 ohm ±2% W CARBON FILM
RO140	2412315035	33 ohm ±2% W CARBON FILM
RO141	2412315035	33 ohm ±2% W CARBON FILM
RO142	2412315035	33 ohm ±2% W CARBON FILM
RO143	2412315035	33 ohm ±2% W CARBON FILM
RO144	2412315035	33 ohm ±2% W CARBON FILM
RO145	2432026003	0.47/0.47 ohm ±10% 3.15W WIRE WOUND
RO146	2432026003	0.47/0.47 ohm ±10% 3.15W WIRE WOUND
RO147	2432026003	0.47/0.47 ohm ±10% 3.15W WIRE WOUND
RO148	2432026003	0.47/0.47 ohm ±10% 3.15W WIRE WOUND
RO149	2412315035	33 ohm ±2% W CARBON FILM
RO150	2412315035	33 ohm ±2% W CARBON FILM
RO151	2440037026	470 ohm ±5% W METAL OXIDE FILM

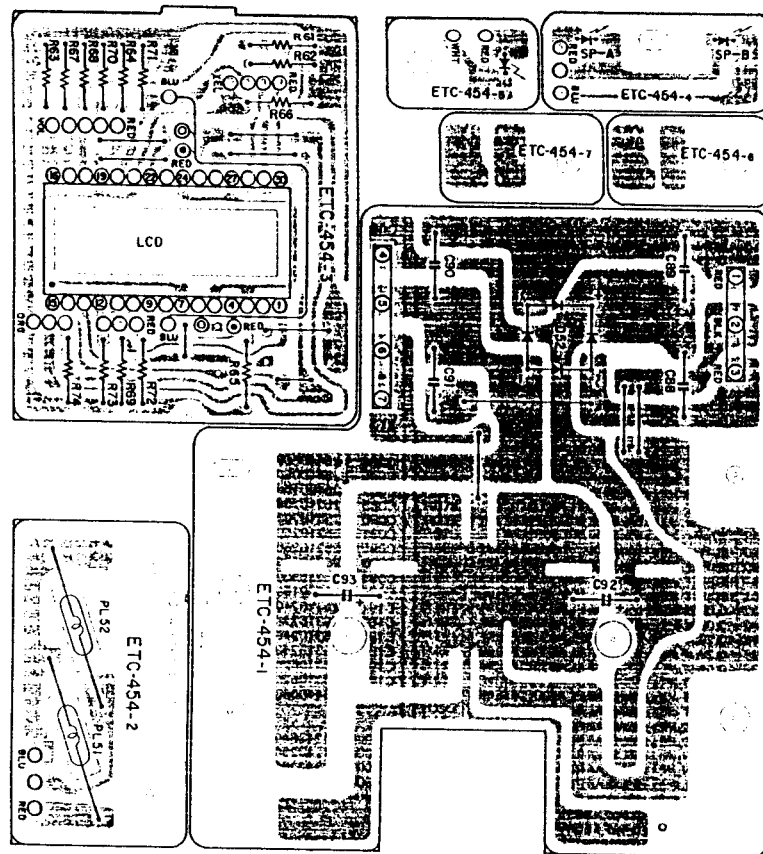
(Con.)

Ref. No.	Part No.	Part Name & Descriptions
R152	2440037026	470 ohm ±5% W METAL OXIDE FILM
R153	2440013024	4.7 ohm ±5% W METAL OXIDE FILM
R154	2440013024	4.7 ohm ±5% W METAL OXIDE FILM
R155	2440013024	4.7 ohm ±5% W METAL OXIDE FILM
R156	2440013024	4.7 ohm ±5% W METAL OXIDE FILM
R157	2440022028	27 ohm ±5% W METAL OXIDE FILM
R158	2440022028	27 ohm ±5% W METAL OXIDE FILM
R162	2440041025	1 k ohm ±5% W METAL OXIDE FILM
R163	2412315051	51 ohm ±2% W CARBON FILM
R164	2412315051	51 ohm ±2% W CARBON FILM
R165	2420203003	10 M ohm ±10% W CARBON COMPOSIT
R166	2420203003	10 M ohm ±10% W CARBON COMPOSIT
R167	2410219007	27 k ohm ±5% W CARBON FILM
R168	2410219007	27 k ohm ±5% W CARBON FILM
R171	2410175002	390 ohm ±5% W CARBON FILM
R176	2440040026	820 ohm ±5% W METAL OXIDE FILM
R190	2440023027	33 ohm ±5% W METAL OXIDE FILM
R195	2412031018	510 k ohm ±5% W CARBON FILM (STANDING)
R196	2412031018	510 k ohm ±5% W CARBON FILM (STANDING)
CAPACITORS		
(not included Ceramic Capacitor 50 V Type)		
C001	2554082048	0.18μF ±5% 100V PLASTIC FILM
C002	2554082048	0.18μF ±5% 100V PLASTIC FILM
C003	2554142001	750pF ±5% 50V PLASTIC FILM
C004	2554142001	750pF ±5% 50V PLASTIC FILM
C005	2554193005	0.1μF ±5% 50V PLASTIC FILM
C006	2554193005	0.1μF ±5% 50V PLASTIC FILM
C007	2554044009	1μF ±5% 50V ELECTROLYTIC
C009	2554121006	100pF ±5% 50V PLASTIC FILM
C010	2554121006	100pF ±5% 50V PLASTIC FILM
C011	2554145008	0.001μF ±5% 50V PLASTIC FILM
C012	2554145008	0.001μF ±5% 50V PLASTIC FILM
C013	2544044009	1μF 50V ELECTROLYTIC
C015	2521026008	47pF ±5% 50V MICA FILM
C016	2521026008	47pF ±5% 50V MICA FILM
C017	2561008060	1μF ±10% 100V METALIZED
C018	2561008060	1μF ±10% 100V METALIZED
C019	2521010001	10pF ±0.5pF 50V MICA FILM
C020	2521010001	10pF ±0.5pF 50V MICA FILM
C021	2554183002	0.039μF ±5% 50V PLASTIC FILM
C022	2554183002	0.039μF ±5% 50V PLASTIC FILM
C023	2551122095	0.27μF ±5% 50V PLASTIC FILM
C024	2551122095	0.27μF ±5% 50V PLASTIC FILM
C025	2554161008	0.0047μF ±5% 50V PLASTIC FILM
C026	2554161008	0.0047μF ±5% 50V PLASTIC FILM
C027	2554127000	180pF ±5% 50V PLASTIC FILM
C028	2554127000	180pF ±5% 50V PLASTIC FILM
C029	2554147006	0.0012μF ±5% 50V PLASTIC FILM
C030	2554147006	0.0012μF ±5% 50V PLASTIC FILM
C031	2554155001	0.0027μF ±5% 50V PLASTIC FILM
C032	2554155001	0.0027μF ±5% 50V PLASTIC FILM
C033	2554187008	0.056μF ±5% 50V PLASTIC FILM
C034	2554187008	0.056μF ±5% 50V PLASTIC FILM
C035	2521081043	10pF ±0.5pF 500V MICA FILM
C036	2521081043	10pF ±0.5pF 500V MICA FILM
C037	2554079048	0.01μF ±10% 100V PLASTIC FILM
C038	2554079048	0.01μF ±10% 100V PLASTIC FILM
C039	2544060025	1μF 100V ELECTROLYTIC
C040	2544060025	1μF 100V ELECTROLYTIC
C041	2554121006	100pF ±5% 50V PLASTIC FILM
C042	2554121006	100pF ±5% 50V PLASTIC FILM
C045	2554121006	100pF ±5% 50V PLASTIC FILM
C046	2554121006	100pF ±5% 50V PLASTIC FILM
C047	2544019005	220μF 16V ELECTROLYTIC

Ref. No.	Part No.	Part Name & Descriptions
C048	2544019005	220μF 16V ELECTROLYTIC
C051	2544019005	220μF 16V ELECTROLYTIC
C052	2544019005	220μF 16V ELECTROLYTIC
C053	2544016008	33μF 16V ELECTROLYTIC
C054	2544016008	33μF 16V ELECTROLYTIC
C055	2544016008	33μF 16V ELECTROLYTIC
C056	2544016008	33μF 16V ELECTROLYTIC
C057	2554139001	560pF ±5% 50V PLASTIC FILM
C058	2554139001	560pF ±5% 50V PLASTIC FILM
C059	2554139001	560pF ±5% 50V PLASTIC FILM
C060	2554139001	560pF ±5% 50V PLASTIC FILM
C061	2521010001	10pF ±0.5pF 50V MICA FILM
C062	2521010001	10pF ±0.5pF 50V MICA FILM
C063	2554165004	0.0068μF ±5% 50V PLASTIC FILM
C064	2554165004	0.0068μF ±5% 50V PLASTIC FILM
C065	2554161008	0.0047μF ±5% 50V PLASTIC FILM
C066	2554161008	0.0047μF ±5% 50V PLASTIC FILM
C067	2554161008	0.0047μF ±5% 50V PLASTIC FILM
C068	2554161008	0.0047μF ±5% 50V PLASTIC FILM
C069	2554165004	0.0068μF ±5% 50V PLASTIC FILM
C070	2554165004	0.0068μF ±5% 50V PLASTIC FILM
C071	2544059078	2.2μF 63V ELECTROLYTIC
C073	2544059078	4.7μF 63V ELECTROLYTIC
C074	2544059078	4.7μF 63V ELECTROLYTIC
C075	2554169000	0.01μF ±5% 50V PLASTIC FILM
C076	2554169000	0.01μF ±5% 50V PLASTIC FILM
C077	2544059036	4.7μF 63V ELECTROLYTIC
C078	2544059036	4.7μF 63V ELECTROLYTIC
C079	2544059078	2.2μF 63V ELECTROLYTIC
C081	2521079039	47pF ±10% 500V MICA FILM
C082	2521079039	47pF ±10% 500V MICA FILM
C083	2544044009	1μF 500V ELECTROLYT

• For PMA-770

ETC-454B RECT & LCD UNIT

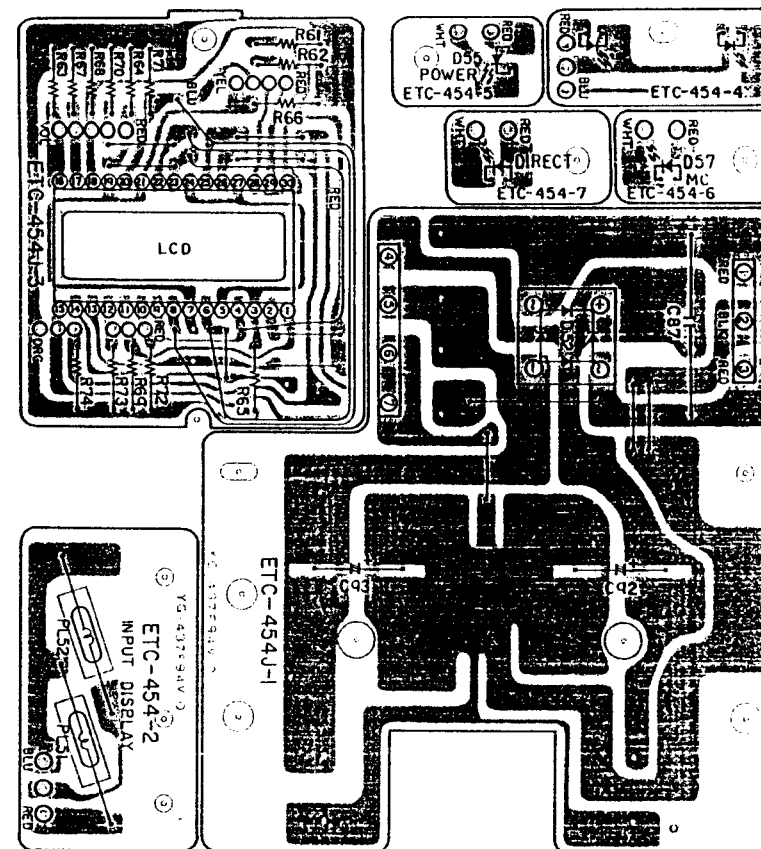


ETC-454B RECT & LCD UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS			OTHER PARTS		
D052	2760233005	M4C-51 DIODE	2220765000	P.W. BOARD	
D053	3939149000	BG5531K GREEN LIGHT EMITTING DIODE	2050087039	3P TERMINAL	
D054	3939149000	8F5531K GREEN LIGHT EMITTING DIODE	2050087042	4P TERMINAL	
	3939149013	PR5531K RED LIGHT EMITTING DIODE	2090008162	JUMPER P=20mm USED 1	
	3939130006	LCD DISPLAY	2090008120	JUMPER P=10mm USED 8	
RESISTORS (not included Carbon Film $\pm 5\%$, $\%W$ Type)			2090008146	JUMPER P=5mm USED 2	
CAPACITORS (not included Ceramic 50V Type)			3930060010	PILOT LAMP (14V, 200 mA)	
C088	2561017019	0.01 μ F $\pm 10\%$ 630V METALLIZED	3930060010	PILOT LAMP (14V, 200 mA)	
C089	2561017019	0.01 μ F $\pm 10\%$ 630V METALLIZED	2034146035	3P CONNECTOR CORD FOR POWER	
C090	2561017019	0.01 μ F $\pm 10\%$ 630V METALLIZED	2034147034	3P CONNECTOR CORD FOR SP	
C091	2561017019	0.01 μ F $\pm 10\%$ 630V METALLIZED	2036082045	4P CONNECTOR CORD FOR LCD	
C092	2546058006	22000 μ F/22000V 63V ELECTROLYTIC	2038091047	5P CONNECTOR CORD FOR LCD	
C093	2546058006	22000 μ F/22000V 63V ELECTROLYTIC	2040075051	6P CONNECTOR CORD FOR LCD	
			4120952102	CONDENSER BRACKET	
			4730354019	TAPPING SCREW (213x8)	
			1430231008	COLOR PLATE	

• For PMA-750

ETC-454K (For E2), 454K (For EK), 454M (For E1) RECT & LCD UNIT

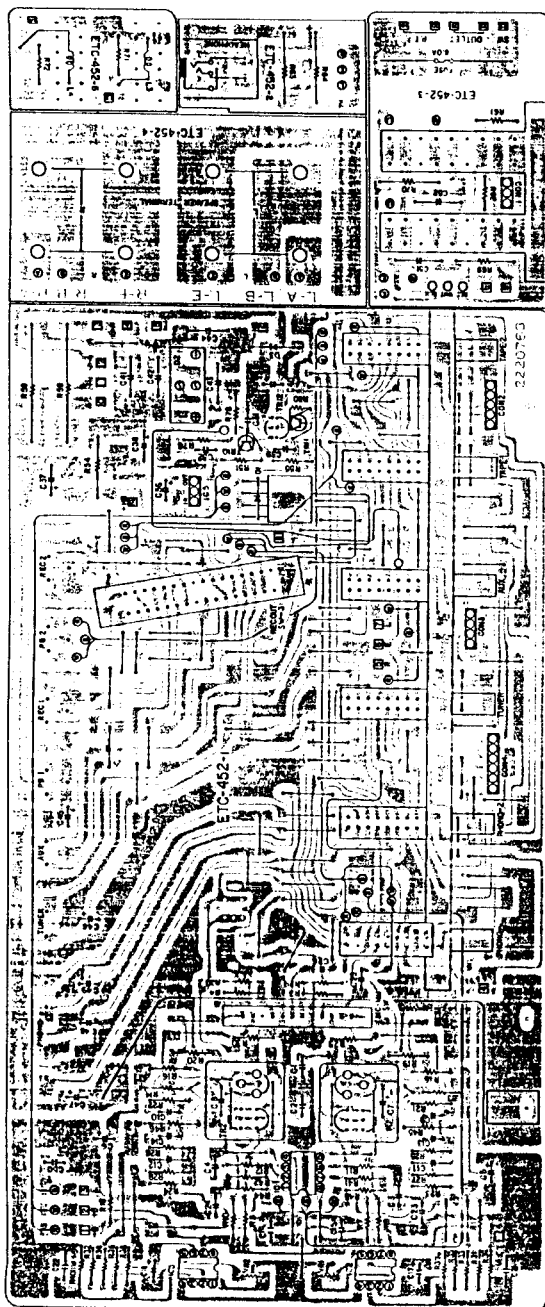


ETC-454K RECT & LCD UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS			OTHER PARTS		
D052	2760233005	M4C-51 DIODE	2220765000	P.W. BOARD	
D053	3939149000	BG5531K GREEN LIGHT EMITTING DIODE	2050087039	3P TERMINAL	
D054	3939149000	8G5531K GREEN LIGHT EMITTING DIODE	2050087042	4P TERMINAL	
	3939149013	PR5531K RED LIGHT EMITTING DIODE	2090008133	JUMPER P=7.5mm USED 1	
	3939149013	PR5531K RED LIGHT EMITTING DIODE	2090008120	JUMPER P=10mm USED 9	
D055	3939149013	PR5531K RED LIGHT EMITTING DIODE	2090008162	JUMPER P=20mm USED 1	
D056	3939149000	8G5531K GREEN LIGHT EMITTING DIODE	3930060010	PILOT LAMP (14 V, 200 mA)	
D057	3939149000	8G5531K GREEN LIGHT EMITTING DIODE	3930060010	PILOT LAMP (14 V, 200 mA)	
	3939130006	LCD DISPLAY	2034146035	3P CONNECTOR CORD FOR POWER	
			2034147034	3P CONNECTOR CORD FOR SP	
			2036082045	4P CONNECTOR CORD FOR LCD	
			2038091047	5P CONNECTOR CORD FOR LCD	
			2040075051	6P CONNECTOR CORD FOR LCD	
			4120952102	CONDENSER BRACKET	
			4730354019	TAPPING SCREW (213x8)	
			1430231008	COLOR PLATE	
RESISTORS (not included Carbon Film $\pm 5\%$, $\%W$ Type)			CAPACITORS		
C087	2561017019	0.01 μ F $\pm 10\%$ 630V METALLIZED			
C092	2546063004	15000/15000 μ F 63V ELECTROLYTIC			
C093	2546063004	15000/15000 μ F 63V ELECTROLYTIC			

• For PMA-770

ETC-452B (For E2), 452D (For E1) INPUT & EQ. UNIT

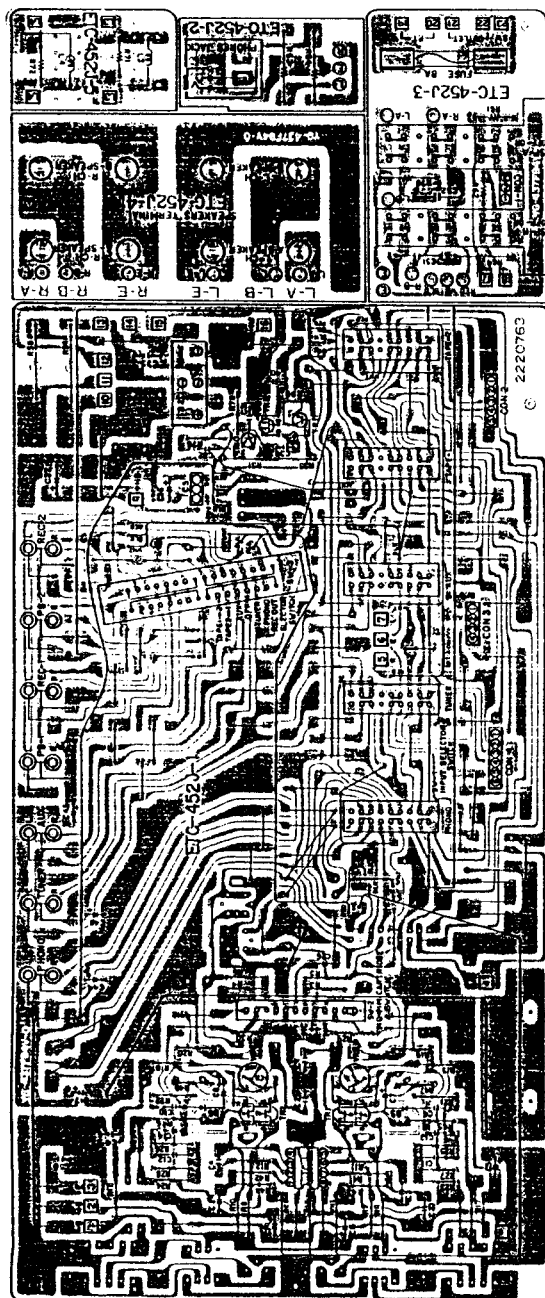


ETC-452B INPUT & EQ. UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS					
IC001	2650034013	NJM4559D INTEGRATED CIRCUIT	C021	2554169000	0.01 μ F \pm 5% 50V PLASTIC FILM
IC002	2630133002	MPC741C INTEGRATED CIRCUIT	C022	2554169000	0.01 μ F \pm 5% 50V PLASTIC FILM
IC003	2630133002	MPC741C INTEGRATED CIRCUIT	C023	2554161008	0.0047 μ F \pm 5% 50V PLASTIC FILM
IC005	2630155006	μ PC78M15 INTEGRATED CIRCUIT	C024	2554161008	0.0047 μ F \pm 5% 50V PLASTIC FILM
TR001	2750029025	2SK240(BL)/(V) FIELD EFFECT TRANSISTOR	C025	2554164005	0.0062 μ F \pm 5% 50V PLASTIC FILM
TR002	2750029025	2SK240(BL)/(V) FIELD EFFECT TRANSISTOR	C026	2554164005	0.0062 μ F \pm 5% 50V PLASTIC FILM
TR003	2750029025	2SK240(BL)/(V) FIELD EFFECT TRANSISTOR	C031	2539015001	0.1 μ F \pm 20% 25V CERAMIC
TR004	2750029025	2SK240(BL)/(V) FIELD EFFECT TRANSISTOR	C032	2539015001	0.1 μ F \pm 20% 25V CERAMIC
TR010	2710102005	2SA1015(Y) TRANSISTOR	C036	2544019005	220 μ F 16V ELECTROLYTIC
TR011	2710105002	2SA966(Y) TRANSISTOR	C037	2544079029	1000 μ F 25V ELECTROLYTIC
TR012	2750018010	2SK30A(O) FIELD EFFECT TRANSISTOR	C038	2544041002	470 μ F 35V ELECTROLYTIC
D001	2760049008	1S2076 DIODE	C039	2521018003	22pF \pm 5% 50V MICA FILM
D002	2760239009	S1RBA20F DIODE	C040	2544039001	220 μ F 35V ELECTROLYTIC
D003	2760237001	RV06 DIODE	C041	2554084020	0.068 μ F \pm 5% 100V PLASTIC FILM
RESISTORS (not included Carbon film \pm 5% $\frac{1}{4}$ W Type)			C042	2554084020	0.068 μ F \pm 5% 100V PLASTIC FILM
R021	2412018002	3.9 k ohm \pm 2% $\frac{1}{4}$ W CARBON FILM	C043	2554084020	0.068 μ F \pm 5% 100V PLASTIC FILM
R022	2412018002	3.9 k ohm \pm 2% $\frac{1}{4}$ W CARBON FILM	C044	2554084020	0.068 μ F \pm 5% 100V PLASTIC FILM
R025	2412032091	47 k ohm \pm 2% $\frac{1}{4}$ W CARBON FILM	C045	2544043000	0.47 μ F 50V ELECTROLYTIC
R026	2412032091	47 k ohm \pm 2% $\frac{1}{4}$ W CARBON FILM	C046	2544043000	0.47 μ F 50V ELECTROLYTIC
R054	2440020020	18 ohm \pm 5% 1W METAL OXIDE FILM	C047	2544043000	0.47 μ F 50V ELECTROLYTIC
R058	24400136024	39 ohm \pm 5% 3.15W METAL OXIDE FILM	C048	2544043000	0.47 μ F 50V ELECTROLYTIC
R059	24400136024	39 ohm \pm 5% 3.15W METAL OXIDE FILM	C049	2544043000	0.47 μ F 50V ELECTROLYTIC
R063	2440087021	120 ohm \pm 5% 2W METAL OXIDE FILM	C050	2531024003	0.01 μ F \pm 80, -20% 50V CERAMIC
R064	2440087021	120 ohm \pm 5% 2W METAL OXIDE FILM	C051	2551121067	0.022 μ F \pm 5% 50V PLASTIC FILM
R069	2440017020	10 ohm \pm 5% 1W METAL OXIDE FILM	C052	2551121067	0.022 μ F \pm 5% 50V PLASTIC FILM
R070	2440017020	10 ohm \pm 5% 1W METAL OXIDE FILM	OTHER PARTS		
R080	2442012023	4.7 ohm \pm 5% $\frac{1}{4}$ W METAL OXIDE FILM		2220763109	P.W. BOARD
CAPACITORS (not included Ceramic 50 V Type)				2050134908	TERMINAL PIN USED 22
C001	2554123004	120pF \pm 5% 50V PLASTIC FILM		2090047903	JUMPER WIRE USED 81
C002	2554123004	120pF \pm 5% 50V PLASTIC FILM		EP 5667H1	TERMINAL USED 2
C003	2554145008	0.001 μ F \pm 5% 50V PLASTIC FILM		2090008133	JUMPER P=7.5mm USED 5
C004	2554145008	0.001 μ F \pm 5% 50V PLASTIC FILM		2090008117	JUMPER P=10mm USED 1
C005	2544011003	220 μ F 10V ELECTROLYTIC		2090008120	JUMPER P=12.5mm USED 9
C006	2544011003	220 μ F 10V ELECTROLYTIC		2090008146	JUMPER P=5mm USED 3
C007	2541035008	1 μ F \pm 20% 35V ELECTROLYTIC		FEP-1261	JUMPER WIRE USED 3
C008	2541035008	1 μ F \pm 20% 35V ELECTROLYTIC	VR001	2116014030	SEMI FIXED RESISTOR 100 k ohm
C009	2554145008	0.001 μ F \pm 5% 50V PLASTIC FILM	VR002	2116014030	SEMI FIXED RESISTOR 100 k ohm
C010	2554145008	0.001 μ F \pm 5% 50V PLASTIC FILM	LR001	2140020003	READ RELAY L23(M)
C011	2554085032	0.068 μ F \pm 2% 50V PLASTIC FILM		4140116106	SHIELD COVER USED 2
C012	2554085032	0.068 μ F \pm 2% 50V PLASTIC FILM	L003	2320017001	INDUCTOR
C013	2554085016	0.018 μ F \pm 2% 50V PLASTIC FILM	L004	2320017001	INDUCTOR
C014	2554085016	0.018 μ F \pm 2% 50V PLASTIC FILM		4170043100	RADIATOR
C017	2544010004	100 μ F 10V ELECTROLYTIC	SW001	4730354019	TAPPING SCREW (213x8)
C018	2544010004	100 μ F 10V ELECTROLYTIC		2124326105	6P PUSH SWITCH INPUT SELECTOR
			SW002	2124330007	SLIDE SWITCH (4-2) REMOTE CARTRIDGE
			SW003	2124331006	SLIDE SWITCH (4-6) REMOTE REC OUT
			SW004	2124327007	2P PUSH SWITCH S.P. SWITCH
				2048047007	HEADPHONE JACK
				2050144008	8P TERMINAL FOR SP
				2035622008	3P CONNECTOR BASE FOR SP LED
				2035622024	4P MINI CON. PIN FOR LCD
				2035622066	5P MINI CON. PIN FOR LCD
				2035622082	6P CONNECTOR BASE FOR LCD
				2050145007	4P CONNECTOR BASE FOR PHONO
				2040079002	6P CONNECTOR BASE FOR AUX, TUN, TAPE
				4140240001	EARTH PLATE

• For PMA-750

ETC-452K (For E2, EK), 452M (For E1) INPUT & EQ. UNIT



ETC-452K INPUT & EQ. UNIT PARTS LIST

Ref. No.	Part No.	Part Name & Descriptions	Ref. No.	Part No.	Part Name & Descriptions
SEMICONDUCTORS					
IC001	2650034013	NJM4559D INTEGRATED CIRCUIT	C025	2554164005	0.0062 μ F \pm 5% 50V PLASTIC FILM
IC005	2630155006	μ PC78M15 INTEGRATED CIRCUIT	C026	2554164005	0.0062 μ F \pm 5% 50V PLASTIC FILM
TR001	2750029025	2SK240(BL)/(V) FIELD EFFECT TRANSISTOR	C031	2539015001	0.1 μ F \pm 20% 25V CERAMIC
TR002	2750029025	2SK240(BL)/(V) FIELD EFFECT TRANSISTOR	C032	2539015001	0.1 μ F \pm 20% 25V CERAMIC
TR010	2710102005	2SA1015(Y) TRANSISTOR	C035	2561017019	0.01 μ F \pm 10% 630V METALLIZED
TR011	2710105002	2SA966(Y) TRANSISTOR	C036	2544132005	10 μ F 16V ELECTROLYTIC
TR012	2750018010	2SK30A(O) FIELD EFFECT TRANSISTOR	C037	2544079029	1000 μ F 25V ELECTROLYTIC
D002	2760239009	S1RBA20F DIODE	C040	2544039001	220 μ F 35V ELECTROLYTIC
D003	2760237001	RV06 DIODE	C045	2544145005	0.47 μ F 50V ELECTROLYTIC
D005	2760049008	1S2076 DIODE	C046	2544145005	0.47 μ F 50V ELECTROLYTIC
D006	2760049008	1S2076 DIODE	C047	2544145005	0.47 μ F 50V ELECTROLYTIC
RESISTORS (not included Carbon Film \pm 5% $\frac{1}{4}$ W Type)					
R021	2412018002	3.9 k ohm \pm 2% $\frac{1}{4}$ W CARBON FILM	C049	2544145005	0.47 μ F 50V ELECTROLYTIC
R022	2412018002	3.9 k ohm \pm 2% $\frac{1}{4}$ W CARBON FILM	C051	2551121067	0.022 μ F \pm 5% 50V PLASTIC FILM
R025	2412032081	47 k ohm \pm 2% $\frac{1}{4}$ W CARBON FILM	C052	2551121067	0.022 μ F \pm 5% 50V PLASTIC FILM
R026	2412032091	47 k ohm \pm 2% $\frac{1}{4}$ W CARBON FILM	OTHER PARTS		
R045	2420203003	10 M ohm \pm 10% $\frac{1}{4}$ W CARBON COMPOSIT		2220763109	P.W. BOARD
R046	2420203003	10 M ohm \pm 10% $\frac{1}{4}$ W CARBON COMPOSIT		2050134908	TERMINAL PIN USED 21
R058	2440077028	18 ohm \pm 5% 2W METAL OXIDE FILM		2090047903	JUMPER WIRE USED 76
R059	2440077028	18 ohm \pm 5% 2W METAL OXIDE FILM		EP-5667H1	TERMINAL USED 2
R063	2440029021	100 ohm \pm 5% 1W METAL OXIDE FILM		2090008146	JUMPER P=5mm USED 4
R064	2440029021	100 ohm \pm 5% 2W METAL OXIDE FILM		2090008133	JUMPER P=7.5mm USED 7
R069	2440017020	10 ohm \pm 5% 2W METAL OXIDE FILM		2090008120	JUMPER P=10mm USED 1
R070	2440017020	10 ohm \pm 5% 2W METAL OXIDE FILM		2090008117	JUMPER P=12.5mm USED 6
R080	2442012023	4.7 ohm \pm 5% $\frac{1}{4}$ W METAL OXIDE FILM		2090008104	JUMPER P=15mm USED 2
CAPACITORS (not included Ceramic 50V Type)					
C005	2544131006	220 μ F 10V ELECTROLYTIC	VR001	EP-5462H1	SOLID VR 100 ohm
C006	2544131006	220 μ F 10V ELECTROLYTIC	VR002	EP-5462H1	SOLID VR 100 ohm
C007	2541003001	10 μ F \pm 20% 6.3V ELECTROLYTIC	L003	2320017001	INDUCTOR
C008	2541003001	10 μ F \pm 20% 6.3V ELECTROLYTIC	L004	2320017001	INDUCTOR
C009	2554145008	0.001 μ F \pm 5% 50V PLASTIC FILM	SW001	2124342100	5P PUSH SWITCH INPUT SELECTOR
C010	2554145008	0.001 μ F \pm 5% 50V PLASTIC FILM	SW002	2124330007	SLIDE SWITCH (4-2) REMOTE CARTRIDGE
C011	2554189006	0.068 μ F \pm 5% 50V PLASTIC FILM	SW003	2124331006	SLIDE SWITCH (4-6) REMOTE REC OUT
C012	2554189006	0.068 μ F \pm 5% 50V PLASTIC FILM	SW004	2124327007	2P PUSH SWITCH S.P.S.W.
C013	2554175007	0.018 μ F \pm 5% 50V PLASTIC FILM		2048047007	HEADPHONE JACK
C014	2554175007	0.018 μ F \pm 5% 50V PLASTIC FILM		2050144008	8P TERMINAL
C023	2551120084	0.0047 μ F \pm 5% 50V PLASTIC FILM		2035622008	3P CONNECTOR BASE FOR SP LED
C024	2551120084	0.0047 μ F \pm 5% 50V PLASTIC FILM		2050136029	4P CONNECTOR BASE FOR LCD
				2050136032	5P CONNECTOR BASE FOR LCD
				2050136045	6P CONNECTOR BASE FOR LCD
				2036084001	4P CONNECTOR BASE FOR PHONO
				2040079002	6P CONNECTOR BASE FOR AUX, TUN, TAPE
				4140240001	EARTH PLATE
				FEP1261	JUMPER WIRE USED 3

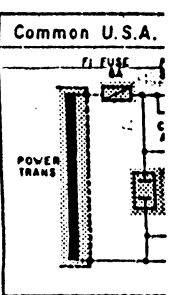
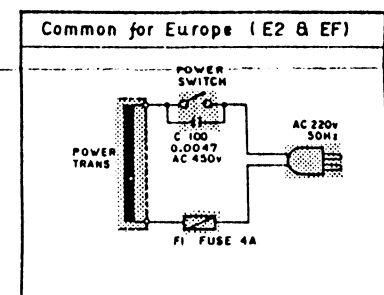
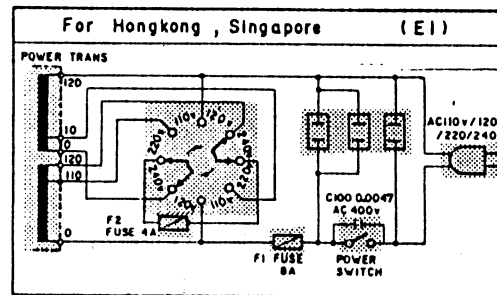
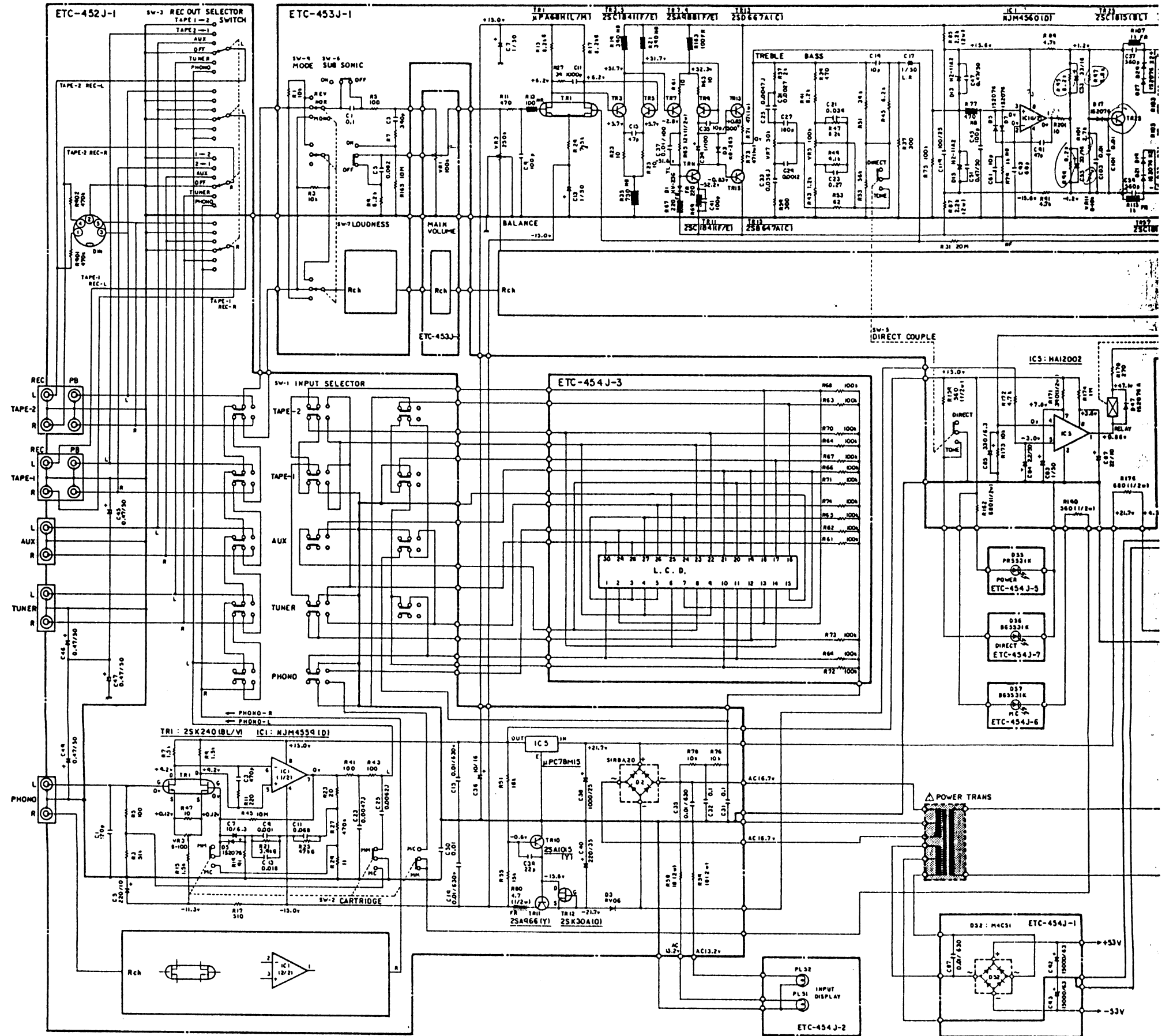
- ## CONNECTION DIAGRAM



WIRING DIAGRAM

• PMA-750

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NOTES:

All resistance values in ohm, K=1,000 ohm, M=1,000,000 ohm.

All capacitance values in microfarad, P=micro-micro farad.

Every voltages and currents is measured at no signal input condition.

Circuit and parts are subject to change without prior notice.

Depending on the area, this circuit diagram varies as shown in the figure below.

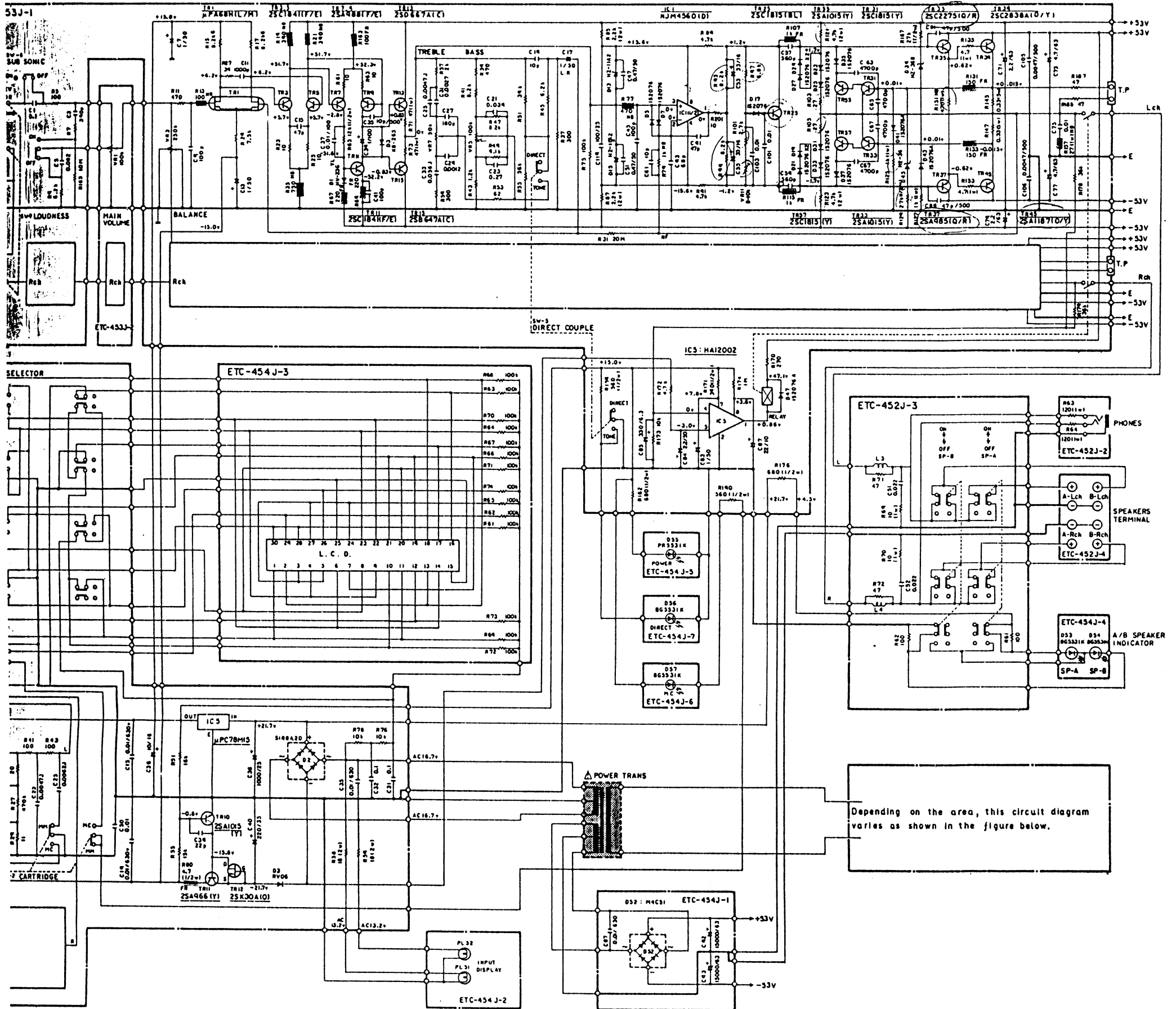
NOTE:

All voltage va negative (-) p

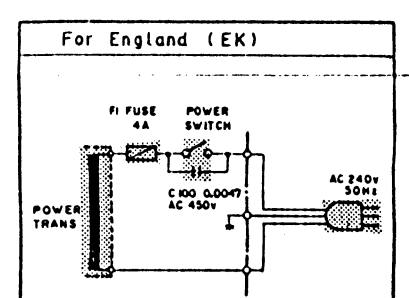
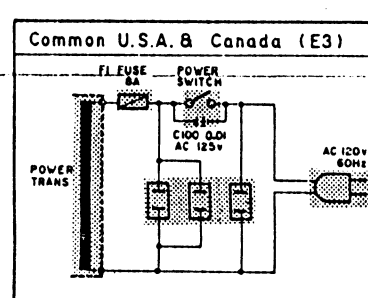
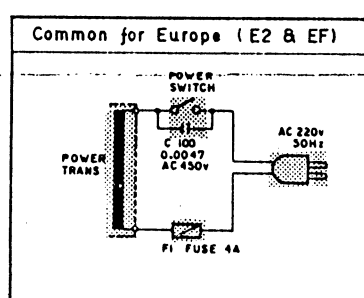
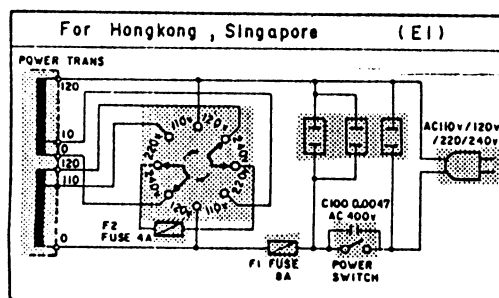
Checking of th and negative

This schematic without notice

⚠ Means important safety item, which must be replaced, when necessary, by a part specified or meeting the specification by the manufacturer.



Depending on the area, this circuit diagram varies as shown in the figure below.



NOTES:

All resistance values in ohm, K=1,000 ohm, M=1,000,000 ohm.

All capacitance values in microfarad, P=micro-micro farad.

Every voltages and currents is measured at no signal input condition.

Circuit and parts are subject to change without prior notice.

Depending on the area, this circuit diagram varies as shown in the figure below.

NOTE:

All voltage values in [] are measured between the specified points and negative (-) polarity power supply source.

Checking of the value in [] must be measured between the specified point and negative (-) polarity power supply source, or damage may invite to the unit.

This schematic diagram is standard and subject to change for improvement without notice